

# 0.8 – 4.0 GHz Frequency Tunable Ultra Low Noise Amplifier



ALND-WB-0008

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3.0 x 3.0 x 1.0 mm  
RoHS Compliant

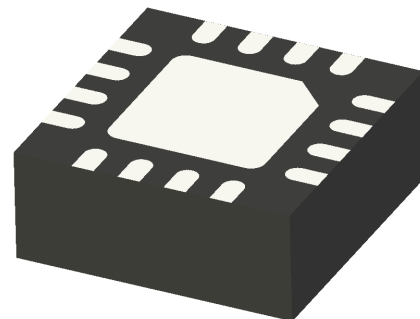
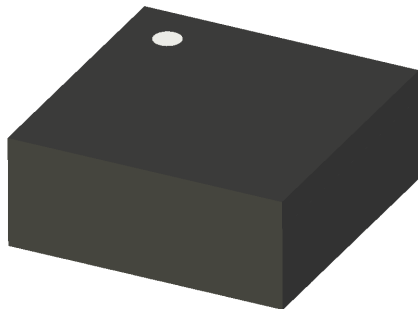
## Features

- Frequency Range: 0.8 – 4.0 GHz
- 0.70 dB Typ. NF
- Tunable Noise match
- 20 dB Gain
- 13dBm Nominal P1dB
- On-chip DC Blocks
- 10-70mA Tunable Bias current
- 0.15-um InGa as PHEMT Technology
- 16-Pin QFN Plastic Package: 3mm x 3mm x 1mm

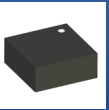
## Applications

- Cellular Macro and Micro Base Stations
- L and S Band Ultra Low Noise Receivers
- Cellular repeaters, DAS and RRH/RRUs
- TDD or FDD systems

## Product Image



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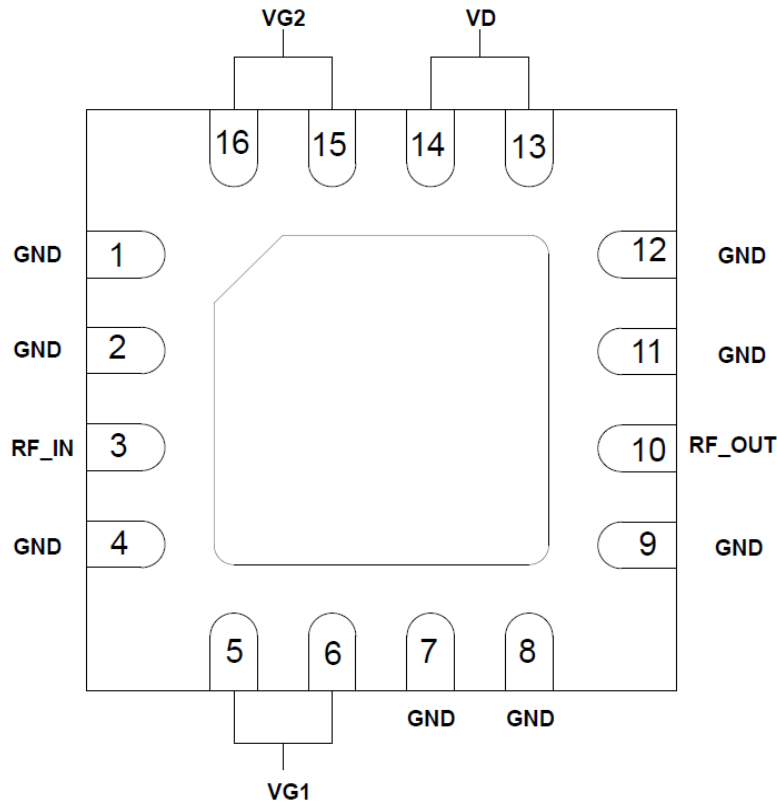


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## Functional Diagram



## Absolute Maximum Ratings

Parameter	Absolute Maximum	Units
Positive DC voltage	7	V
RF Input power	23	dBm
Supply Current	100	mA
Operating Temperature	-55 to +85	°C
Storage Temperature	-65 to +150	°C

1. Operation beyond these limits may cause permanent damage to the component.

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## Electrical Specifications

Parameters Description	Frequency										Unit
	800	900	1280	1575	1800	1900	2170	2400	2700		
Gain	22	22.5	21	20.5	20	20	20	20	20	20	dB
Noise Figure	0.9 (1.2)	0.75 (0.9)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.65	dB
Input Return Loss	-5.5 (-10.5)	-2.7 (-10)	-11.5	-10	-12.5	-14	-13	-13	-17	-13	dB
Output Return Loss	-7.5	-7.8	-11.5	-17	-20	-20	-17	-16	-16	-11	dB
Reverse Isolation	-44	-43	-40	-39	-39	-38	-37	-36	-36	-36	dB
P1dB	13	13	13	13	13	13	13	13	13	13	dBm
OIP3	22	22	22	22	22	22	22	22	22	22	dBm
Supply Current	50	50	50	50	50	50	50	50	50	50	mA
Turning inductor value	@ Vg	16 (12.4)	16 (12.4)	5.6	3.6	1.4	1.4	1.4	1.6	1.6	nH
	@Vd	6.8	6.8	6.8	6.8	4.3	4.3	4.3	0	0	
Turning inductor Part No.	@ Vg	MCI Gold Coil	MCI Gold Coil	0603C S5N6X GL	0603C S3N6X GL	0603C S1N8X GL	0603C S1N6X GL	0603C S1N6X GL	0603C S1N6X GL	0603C S1N6X GL	-
	@Vd	0603C S6N8X GL	0603C S6N8X GL	0603C S6N8X GL	0603C S6N8X GL	0603C S6N8X GL	0603C S5N6X GL	0603C S5N6X GL	0	0	-

@Ta = 25°C, Zo = 50Ω; Vd = +5V, Vg1 = 0.3V, Vg2 = +2.5V

### NOTES:

1. Specs in brackets correspond to Inductor values shown in brackets.
2. Estimated performance.
3. The supply current is tunable between 10-70mA with minor variation in RF Performance

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## Ordering Information

Part Number	Description
ALND-WB-0008	0.8 – 4.0 GHz Frequency Tunable Ultra Low Noise Amplifier Packing: Bulk



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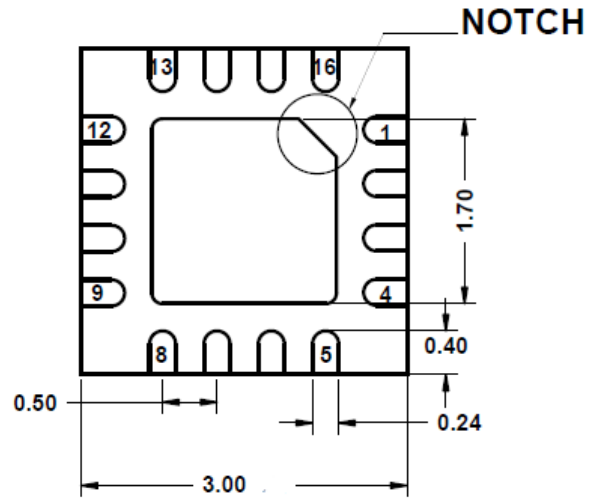
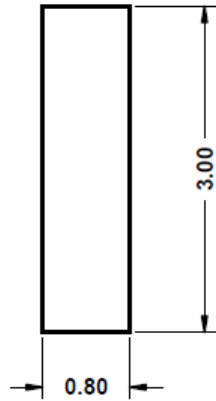
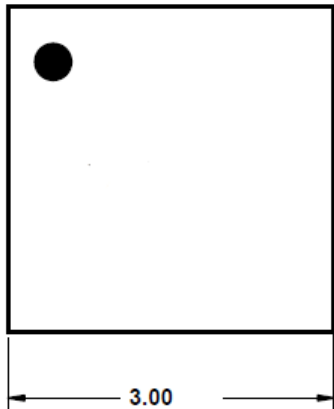


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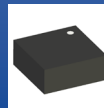
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## Product Dimensions



Unit: mm

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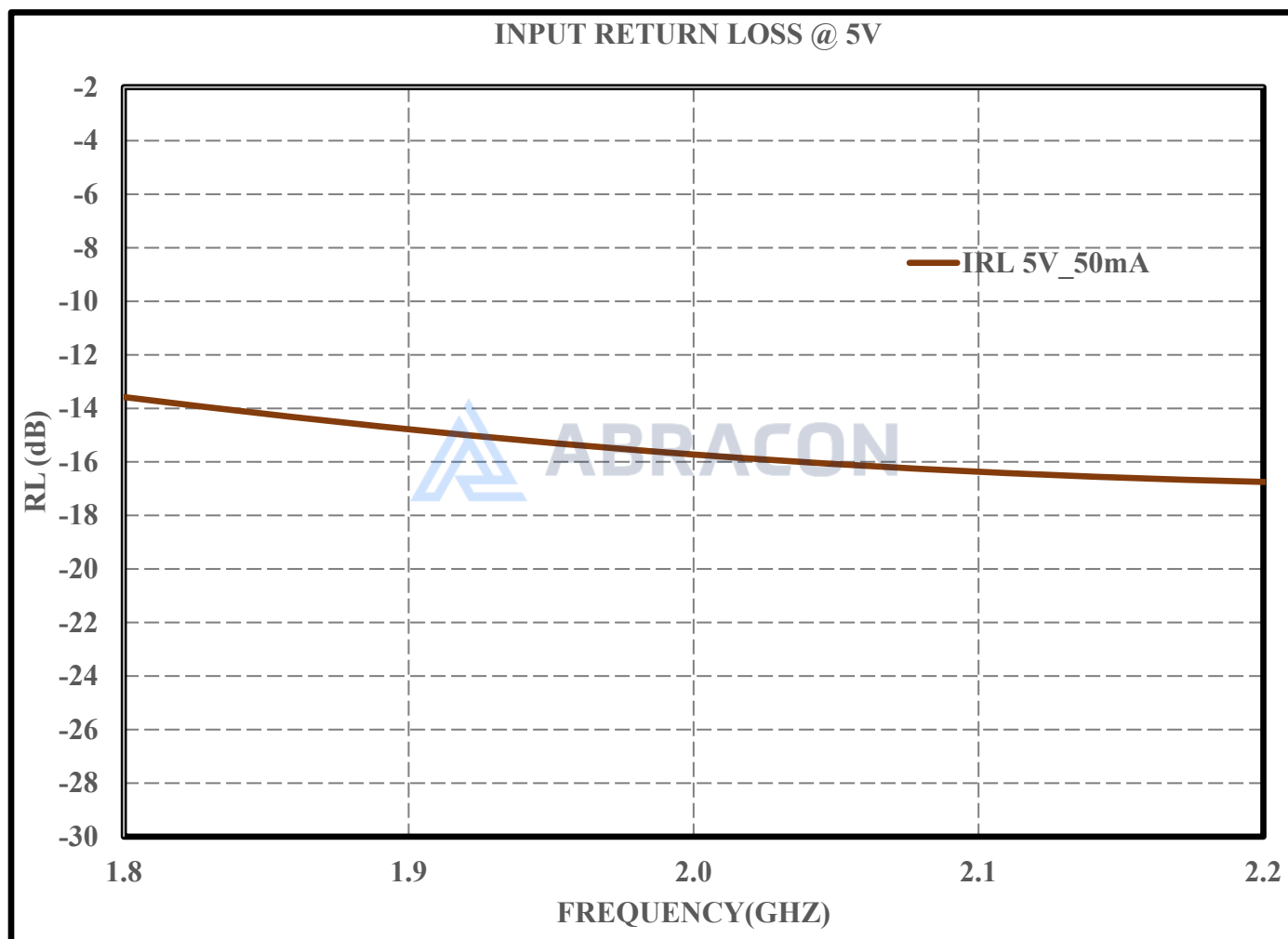
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## Test Fixture Data

### 1.8-2.17 GHz Applications

(Turning Inductor Values @Vg1=1.4nH, @Vd=4.3nH)

### Input Return loss



Vd = +5V, Vg1 = -0.3, Vg2 = +2.5V, Total Current = 50mA, Ta = 25°C

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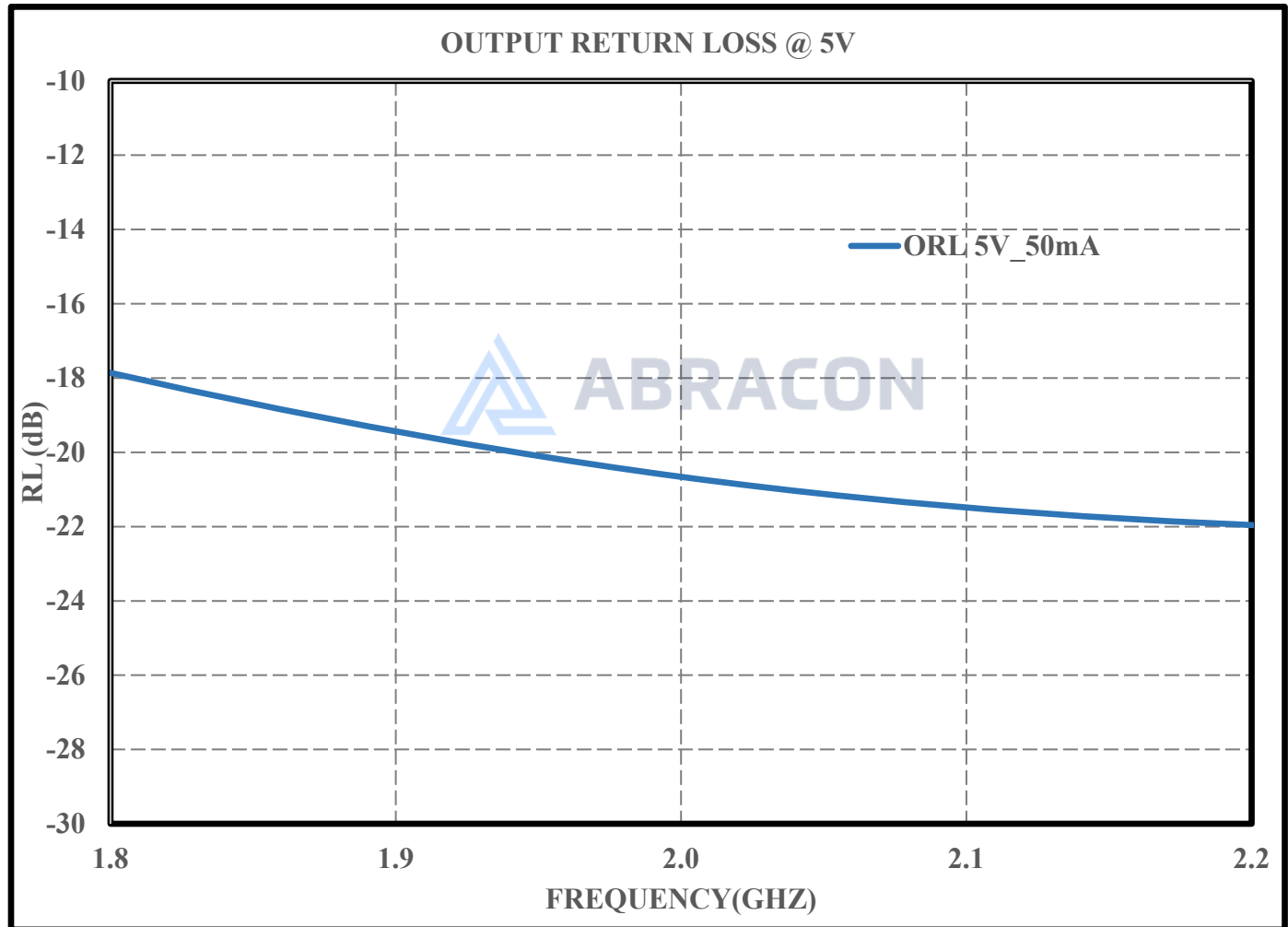


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## Output Return loss



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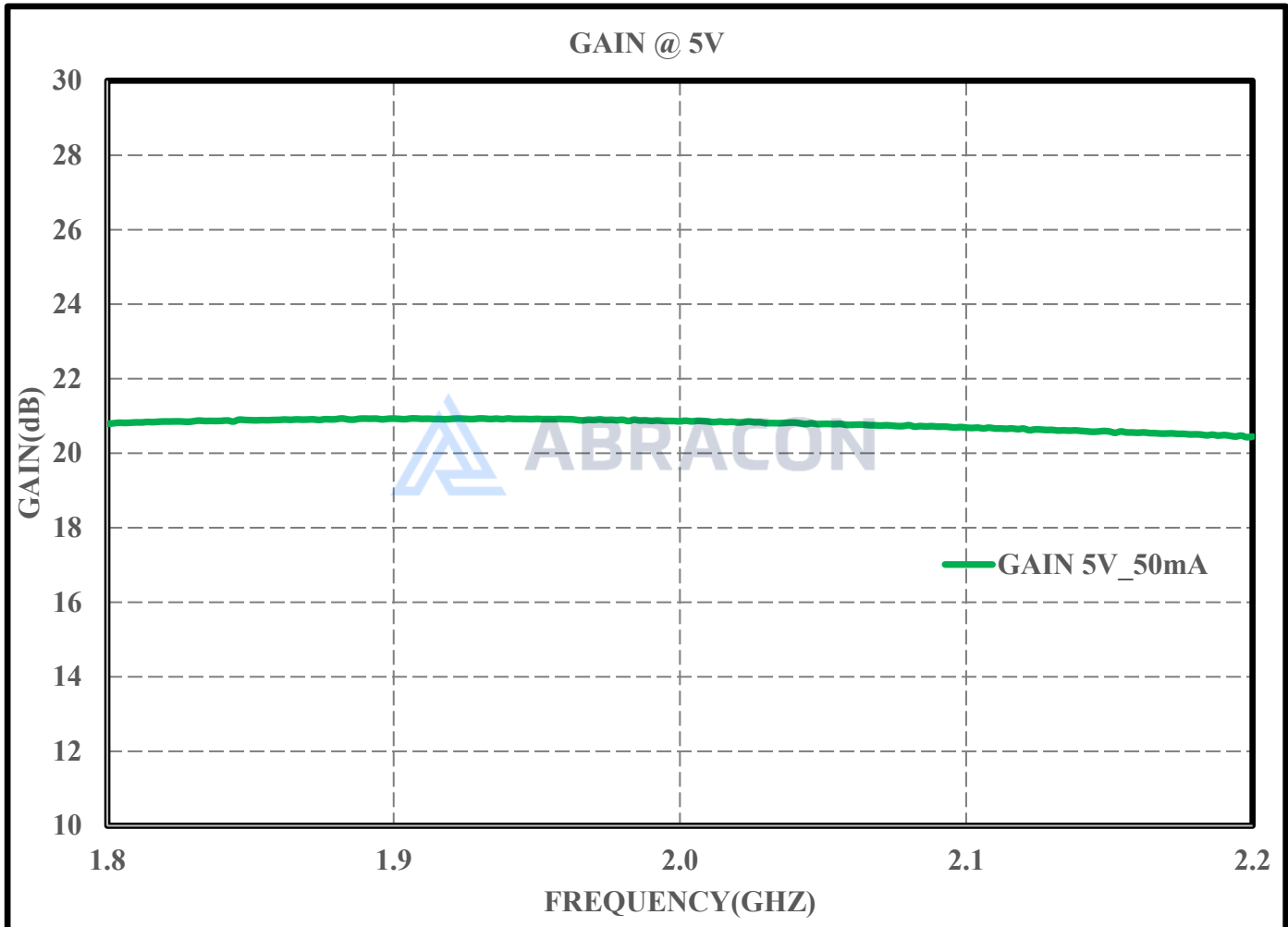


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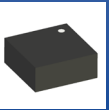
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## Gain





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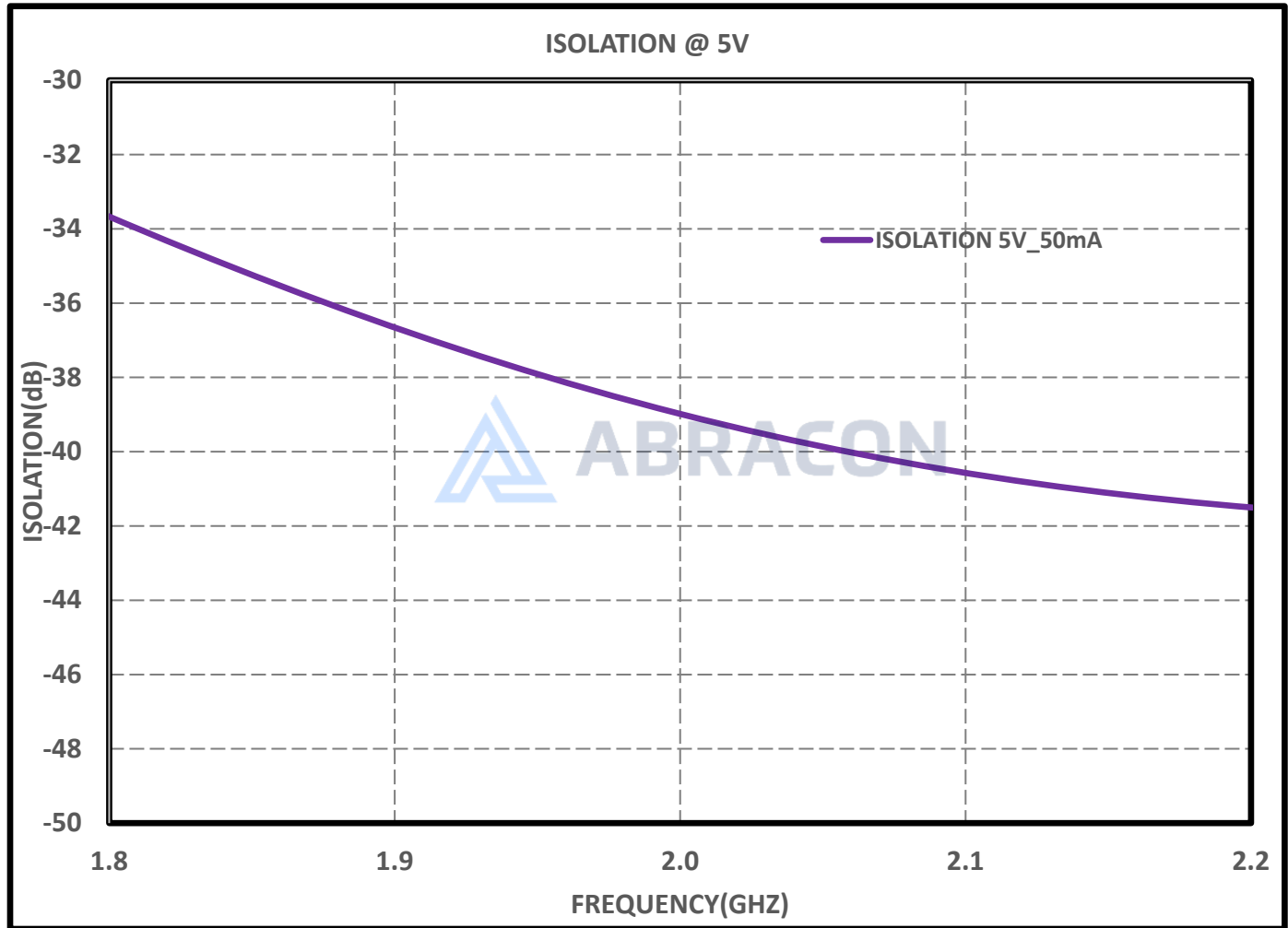
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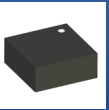
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## Isolation



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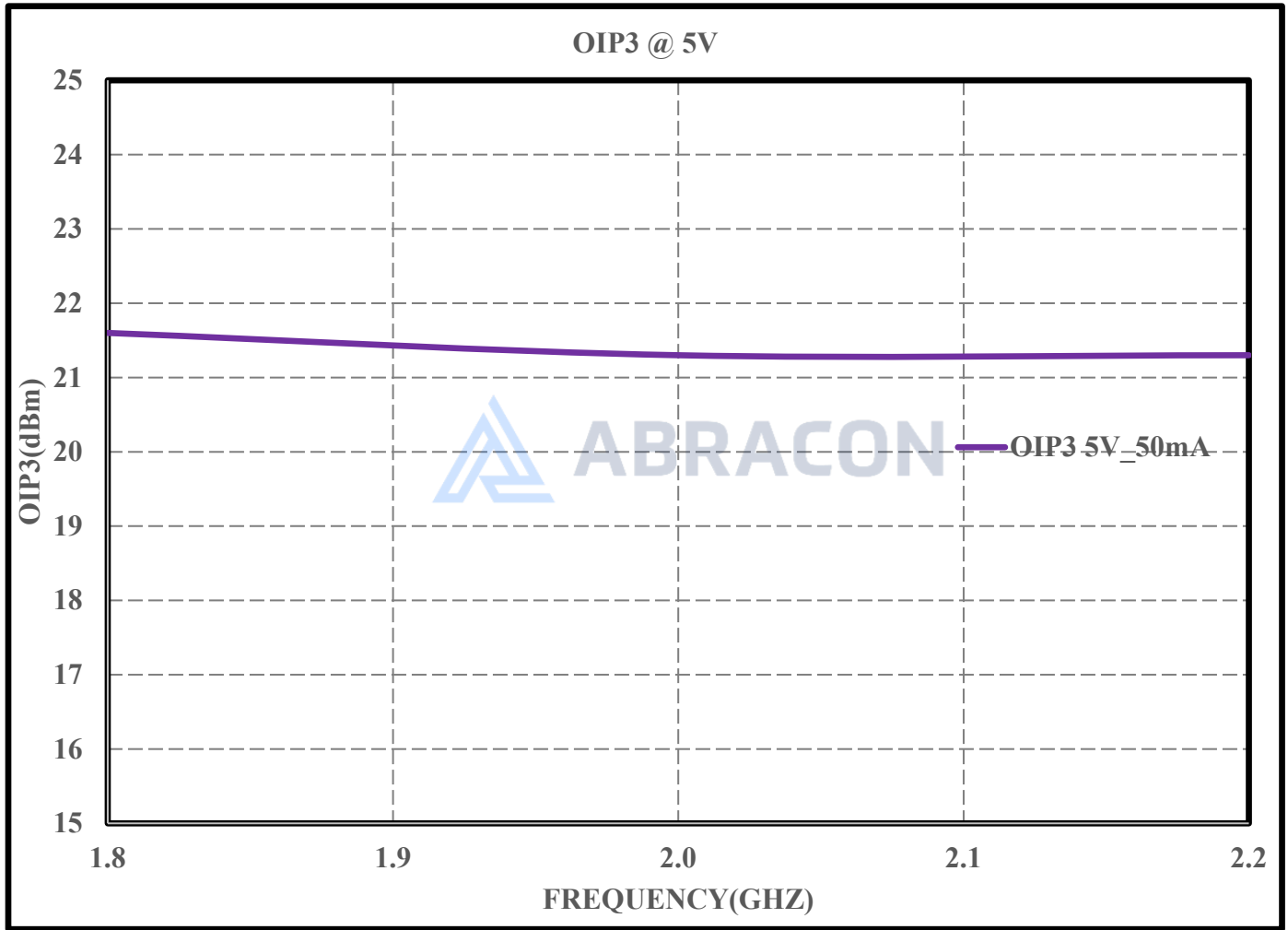


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## OIP3



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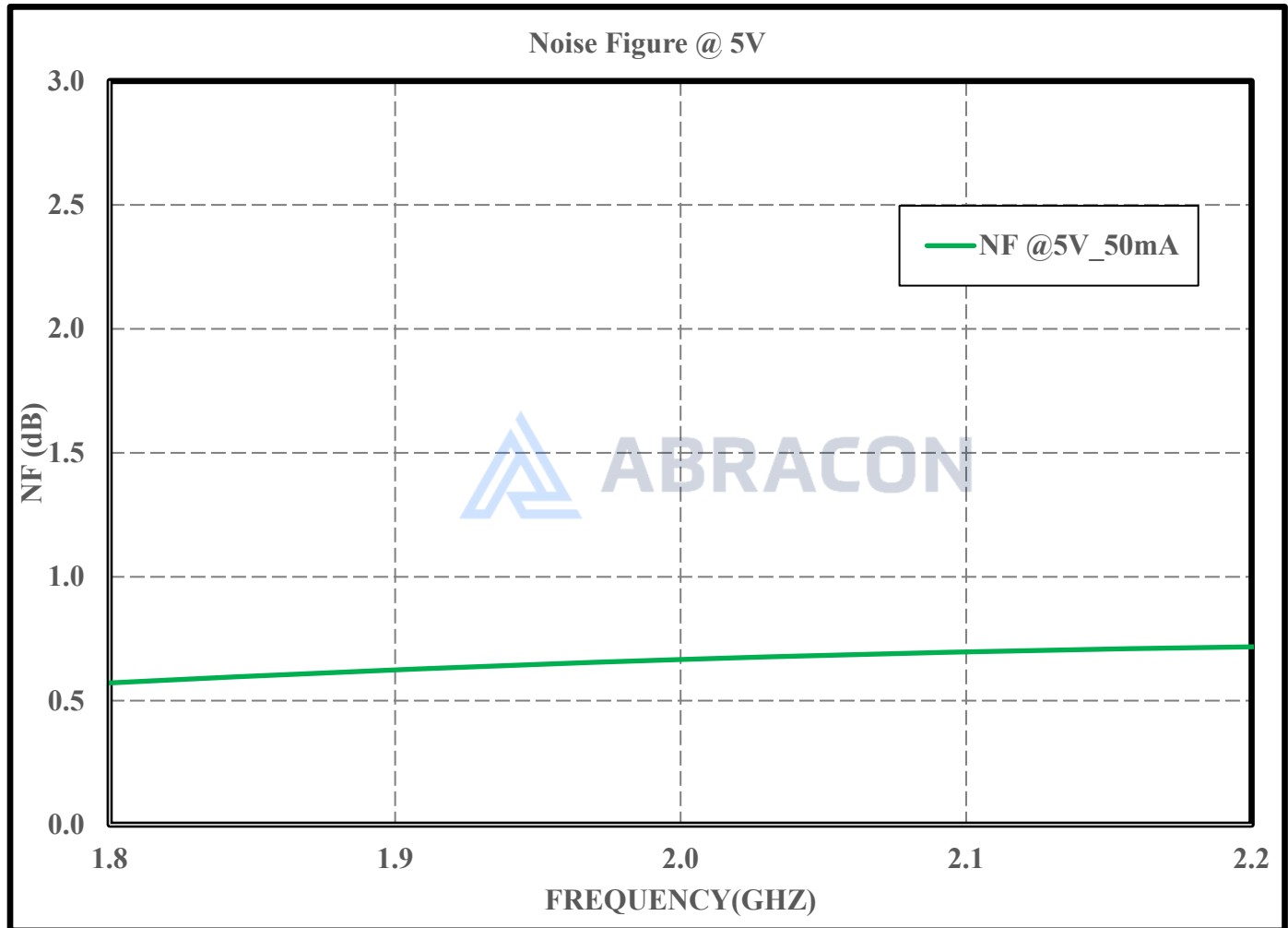
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Request Samples

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## Noise Figure



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Request Samples



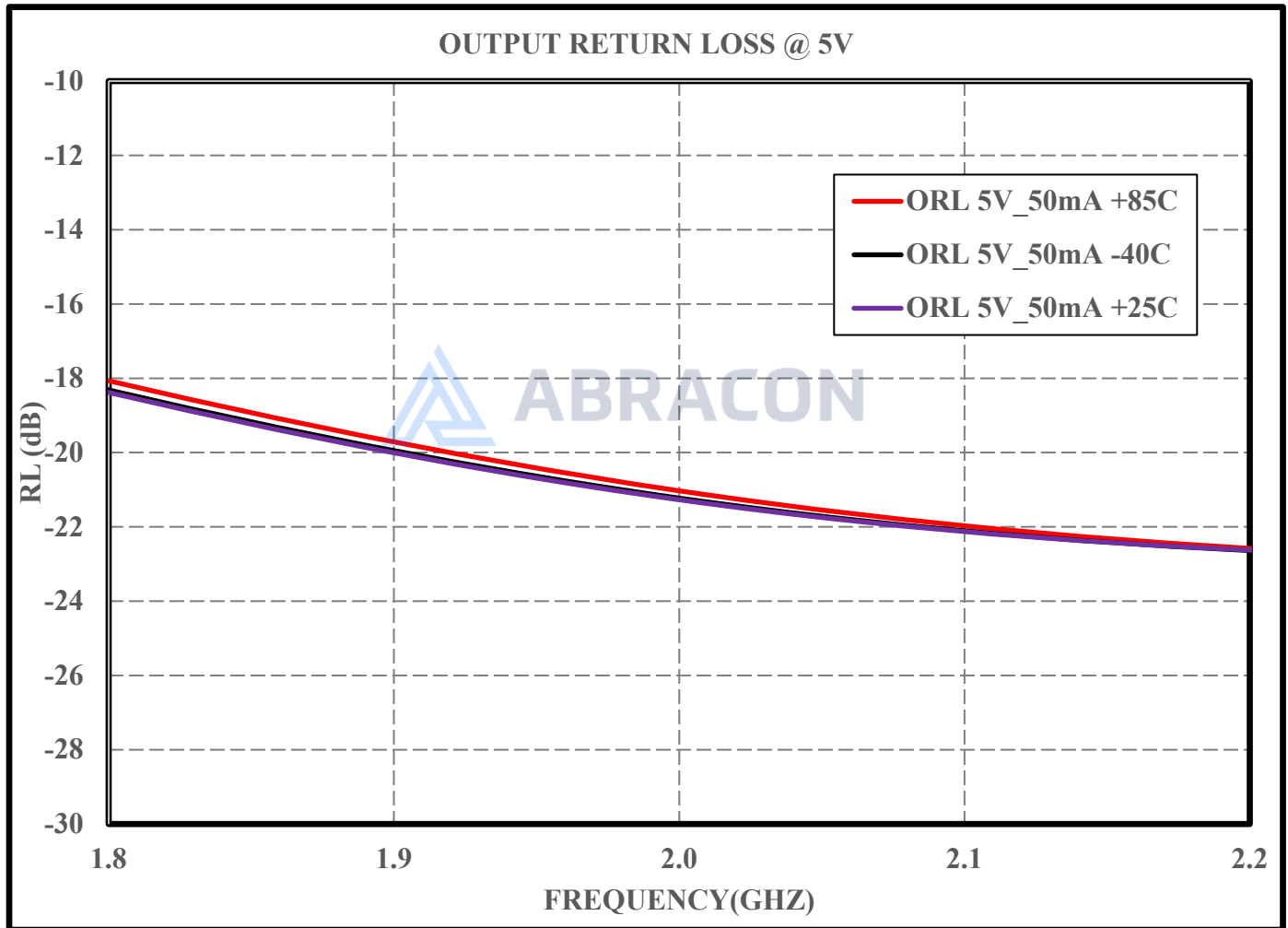
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## Test Fixture Data Over the temperature

### Output Return loss



Vd = +5V, Vg1 = -0.3V, Vg2 = +2.5V, Total Current = 50mA, Ta = 25°C

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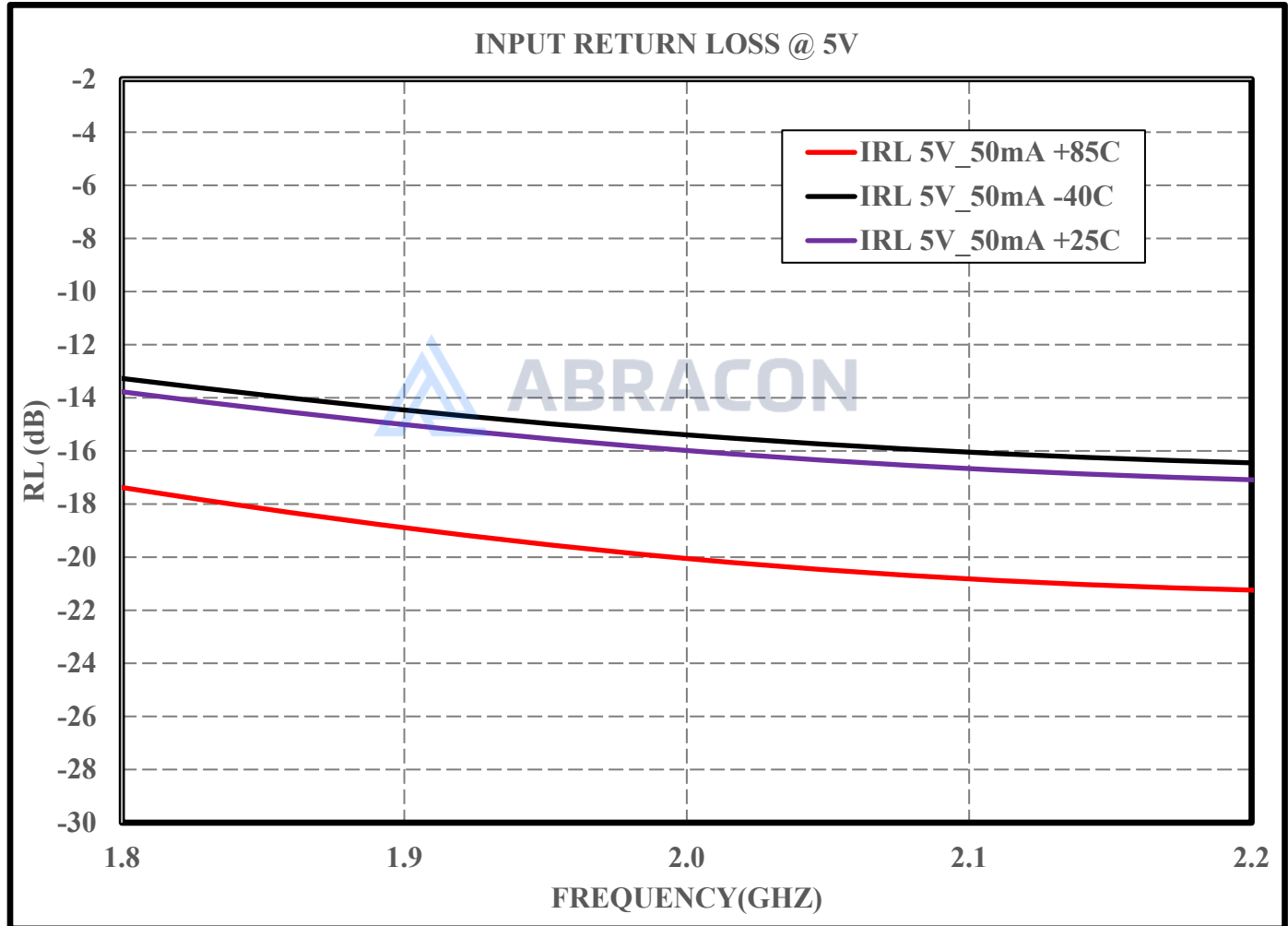


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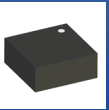


3.0 x 3.0 x 1.0 mm  
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## Input Return loss



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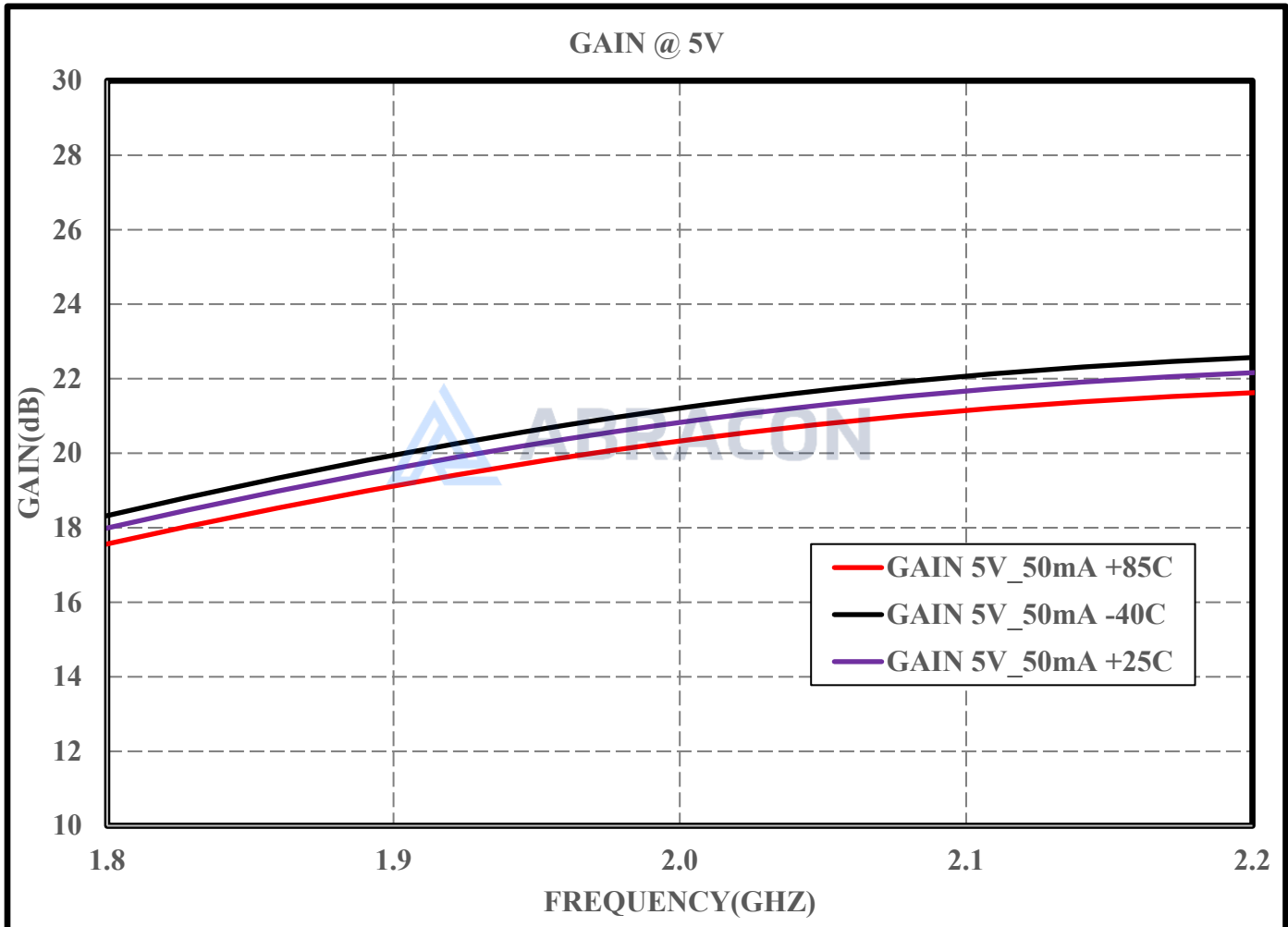
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## Gain



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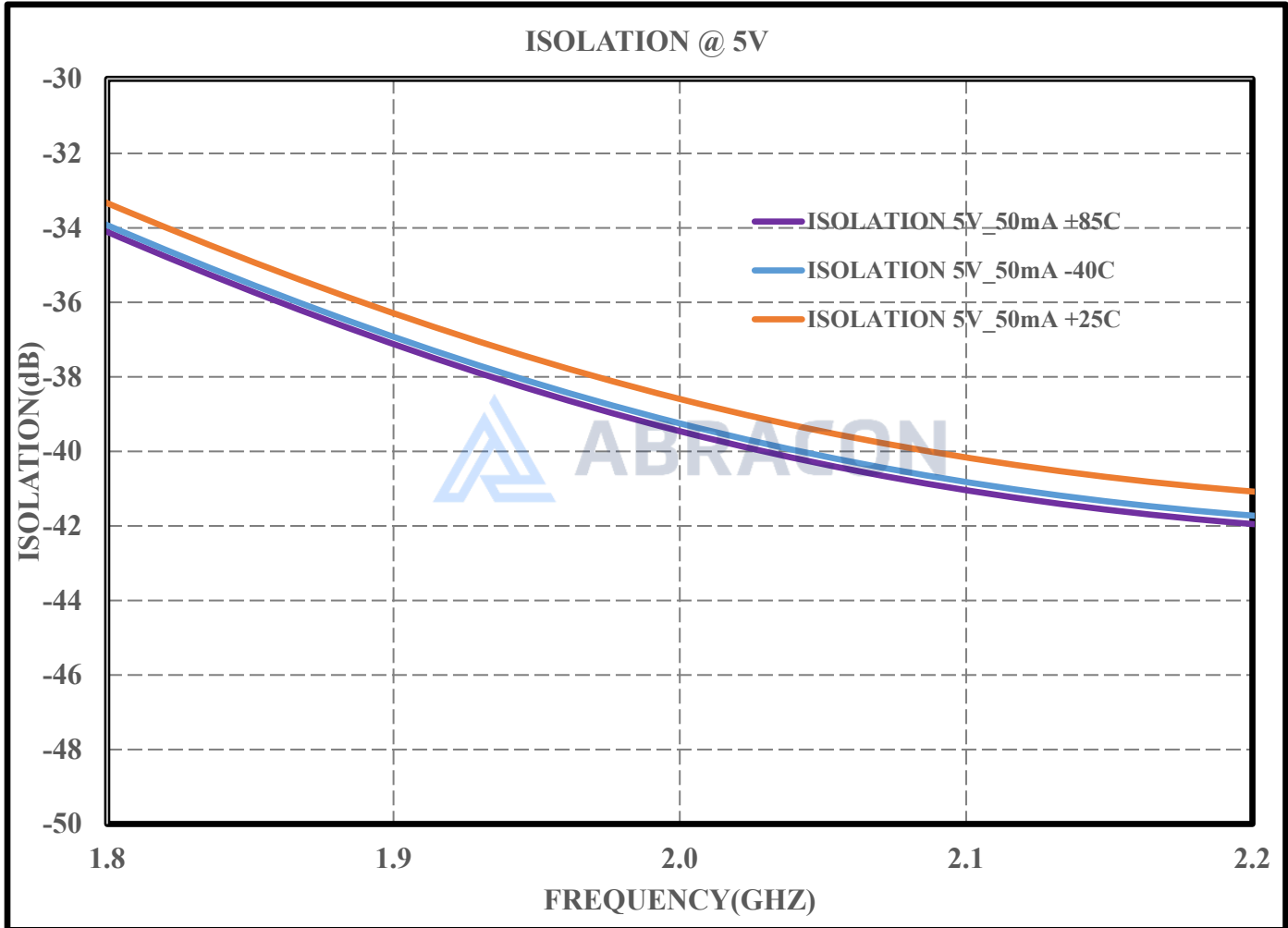


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## Isolation



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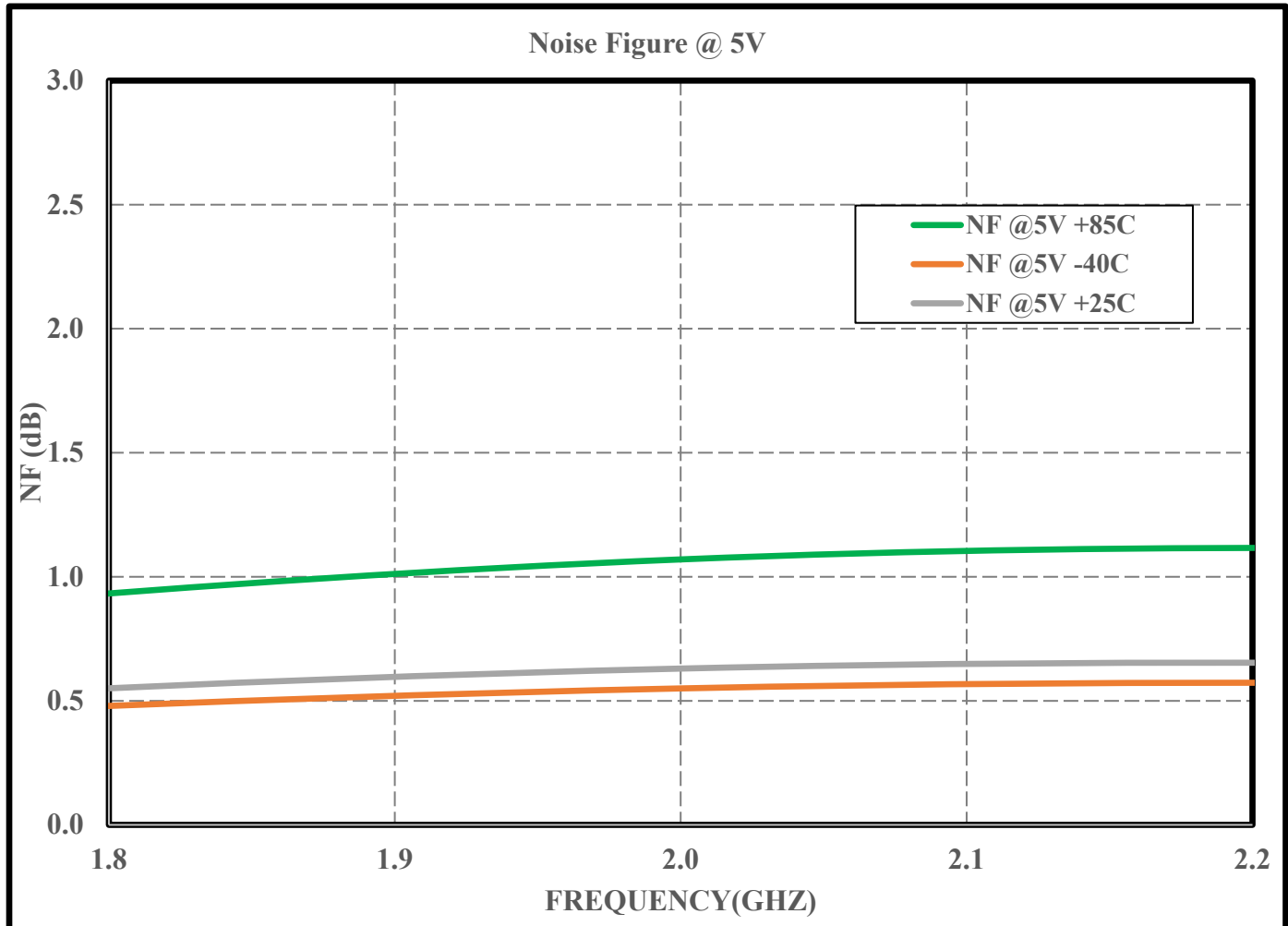
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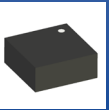
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## Noise Figure





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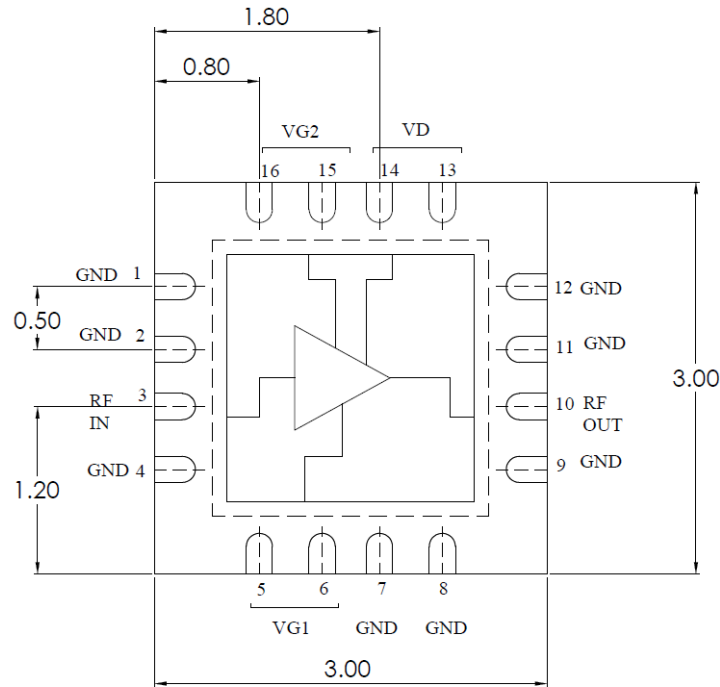


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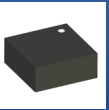
**3.0 x 3.0 x 1.0 mm**  
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## Pin Configuration



Pin Description	
Pin 3	RF in
Pin 5, 6	Gate Bias 1
Pin 10	RF out
Pin 13, 14	Drain Bias
Pin 15, 16	Gate Bias 2
Pin 1, 2, 4, 7, 8, 9, 11, 12	Ground

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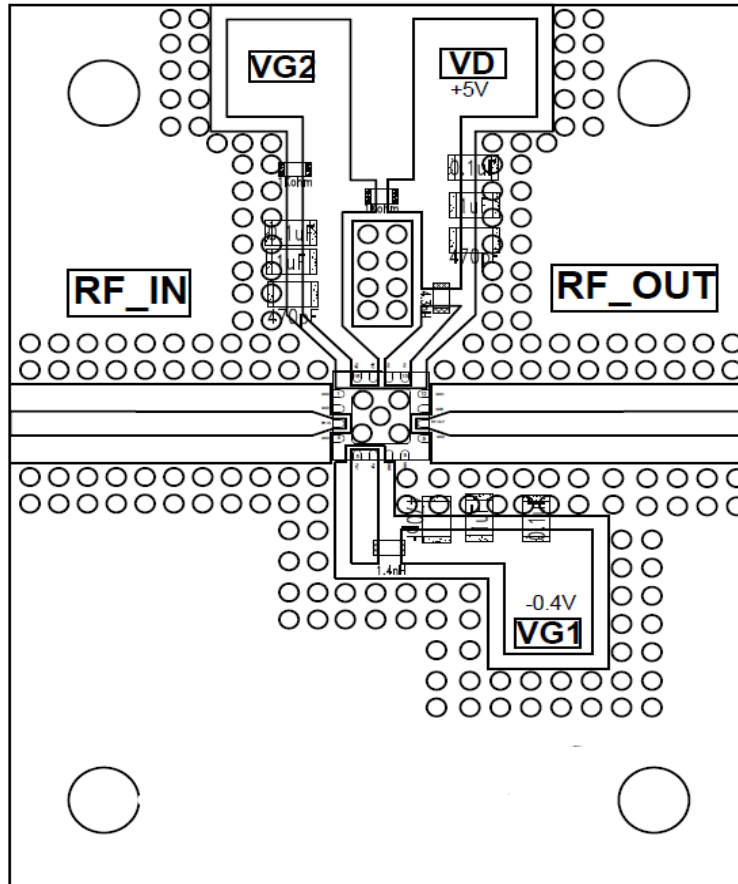


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**3.0 x 3.0 x 1.0 mm**  
**RoHS Compliant**

## Test Board Pattern



### List of Components:

Component ID	Value	Description / Part No.
C1	470 pF	Bypass capacitor / ATC Dicap 116UK471M100TT or equivalent
C2	0.1 uF	2nd Bypass Capacitor (0402 Pkg.)
C3	1uF	3rd Bypass Capacitor (0402 Pkg.)
R1, R2	1K Ohm	Resistor in VG2 Bias network (0402 Pkg.)
L1 & L2	As per the Table “Electrical Specifications”	Freq. Band Tuning Inductors, 0603 Pkg. or Gold Coil
Board Material: RT/ Duroid 5880		

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## Packaging

### Packing Tubes

10pcs per tube, 50 tubes per box

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